

Evaluation of CoViSTA – an Automated Vital Sign Documentation System – in an Inpatient Hospital Setting

Arora M¹, Falsafi N¹, Al-Ibrahim M², Sawyer R², Siegel E², Joshi A¹, Finkelstein J^{1,2}

¹University of Maryland Baltimore, ²Baltimore Veterans Affairs Medical Center

Abstract: The aim of this study was to compare the efficiency and acceptance of the CoViSTA system with the current practice of collecting vital signs. CoViSTA (Computerized Vital Sign Transfer Application) was designed to integrate with the existing hospital network and automate the process of vital sign data entry in hospital wards. The system was evaluated with 6 nurses across 60 patients and was found to significantly reduce errors, improve efficiency and increase satisfaction among the staff.

Background: While most hospitals now rely on electronic medical records for record management, there is usually a time lag between record generation at point-of-care and its availability via the hospital network. This lag is largely due to the delays associated with data entry and can be avoided by leveraging technology to automate these processes. Furthermore, automation of data entry also enforces quality control and helps reduce errors¹.

System Design: CoViSTA has two key components: 1) Software that interfaces with the Computerized Patient Record System (CPRS); and 2) Digital monitors used to take vital signs. The software is designed for MS Windows based devices and was tested on laptops running Windows 2000. CoViSTA automatically captures outputs from the vital sign monitors – Blood Pressure, Pulse, Temperature, Weight and O₂ Saturation – via serial ports. In addition, standardized assessment scales for Pain and Respiration are available through the software interface. A USB barcode reader is also available for scanning wristbands. This data is automatically documented in the CPRS over a secure WiFi network. A portable thermal printer is connected to the system for hardcopies.

Following security requirements of the VA Medical Center, no data is ever stored on the physical memory of the system. CoViSTA retains information in volatile memory only till it is transferred to the patient's medical record.

Methods: The system was evaluated on 6 nurses across 60 patients in a randomized trial. We used a crossover study design where each nurse collected vital signs from 5 patients using their current practice (control group) and 5 patients using the CoViSTA

system (intervention group). Of the 6 nurses, 50% were 31-35 years old, 33% were 41-45 years old and 17% were over 56 years old. Gender distribution was 67% female and 33% male. All nurses were proficient in using computers with at least 5 years hands-on experience.

The time taken for collecting vital signs, and the time lag between collection and availability of vital signs in the CPRS was measured and compared between the routine practice and CoViSTA. Nurses satisfaction was gauged using a Likert Scale based Attitudinal Survey.

Results: The mean time taken for vital signs information to be available for use in the electronic record was 4079.8±7091.8 seconds in the control group and 158.66±66.97 seconds with CoViSTA. This difference was found to be highly significant (p=0.0037). The mean satisfaction score of collecting vital signs in the routine way was 10.33±3.93 and was significantly lower (p=0.0070) than the satisfaction score of 16.5±3.43 with CoViSTA. We analyzed the vital sign information to check for errors in data entry and found errors in 30% of the control group data and 0% in the intervention group. Out of 30 patients in the control group 7 patients had one or more parameters incorrectly entered and the vital signs were not entered at all for 2 patients during the first 24 hours. 100% of the nurses stated that the CoViSTA system can improve their efficiency and save them time. All nurses also agreed that the CoViSTA system was easy to use and preferred it over the routine way.

Conclusion: The CoViSTA system has shown to improve the efficiency, accuracy and completeness of the process of taking vital signs and documenting them. The introduction of CoViSTA into routine clinical practice enables VA nursing staff to collect and instantly document vital signs and reduces time required for data collection.

References:

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